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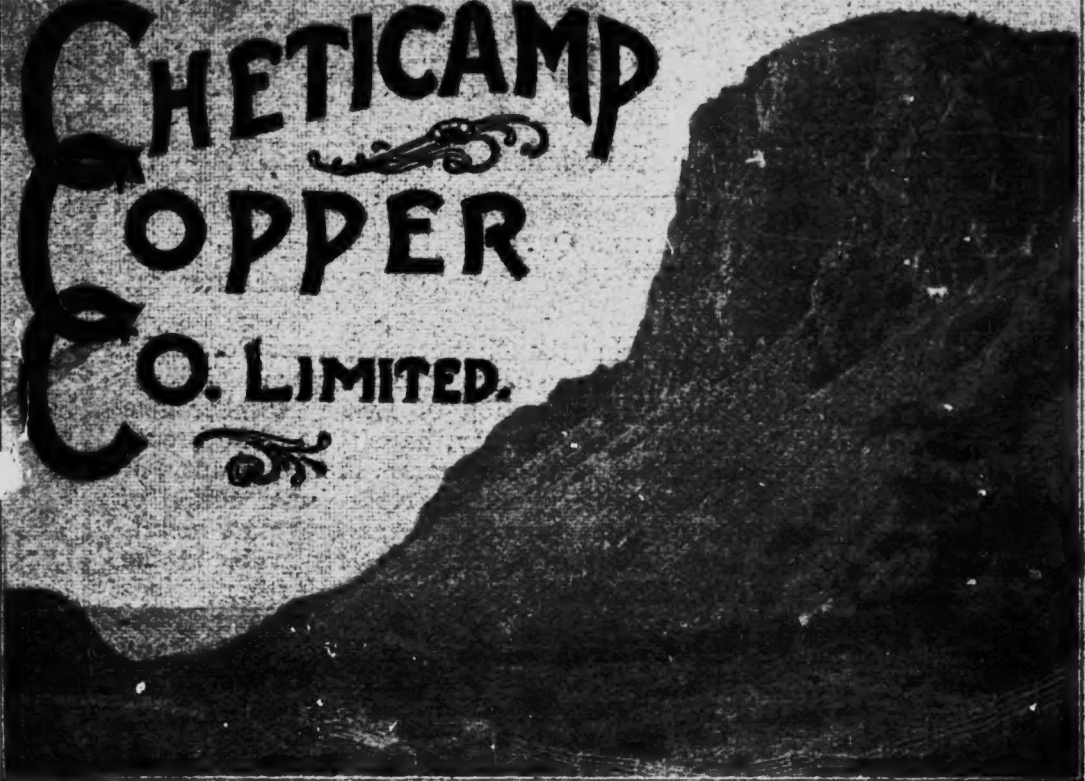
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V.F.V. 14
#5

CHETICAMP COPPER CO. LIMITED.



MOUNT JEROME, CAPE BRETON, NEAR THE ENTRANCE OF CHETICAMP
HARBOUR, G. F. OF ST. LAWRENCE SHOWING ON THE LEFT

INCORPORATED 1904, UNDER THE
NOVA SCOTIA COMPANIES'
ACT

HEAD OFFICE:
HALIFAX, NOVA SCOTIA. - - - CANADA
MINE OFFICE:
CHETICAMP, - - - CAPE BRETON.



Certificate of Title.

DEPARTMENT OF PUBLIC WORKS AND MINES.

MINES OFFICE, HALIFAX, N. S.,

OCTOBER 11, 1904.

This is to Certify that the Cheticamp Copper Co., Ltd., is the owner under Transfer from the Eastern National Copper Company, Ltd., of a portion of Lease Number One Hundred and Three, Inverness County, dated Oct. 22nd, 1900, of one-half square mile, situate at Cheticamp, in said County, of which said Lease gives it the exclusive right for a period of twenty years of Mining Copper, and all other ores and metals associated therewith. The said Lease being renewable at the expiration of said period of twenty years for three further periods of twenty years each, and which Lease is more particularly described at page 253, Registry Book Number Three of Coal and other Leases. Said Lease No. 103 was the first Copper Lease granted in the Cheticamp District.

SEAL

E. GILPIN, JR.

D'Y. COM. P. W. & MINES.

As stated in the above certificate of title issued by the Mines Department, this Company's mining property at Cheticamp was the first property leased for copper mining in that district. Being the first copper lease the property is naturally the choice of locations. Several years ago the original owners of the property took up a very large area of ground to prospect it for valuable minerals. This Company's copper deposit was discovered and located and a lease, covering the deposit, was obtained from the Government. The development which has since been performed on the copper property, proved the existence of a very large body of pay ore, and has attracted much attention to the Cheticamp district as an exceptionally promising mineral field. Several new companies are now commencing operations at Cheticamp with a view to prospecting new territory which they have taken up outside of the large original tract from which this Company's property was selected. They are confident of finding other valuable mineral deposits or the extension of this Company's deposit.



Harbor of Cheticamp and Projected Shipping Pier of the
Nova Scotia Collieries, Limited.

Cheticamp Copper Company, Limited.

Authorized Capital \$2,000,000 (£410,959 stg.), all common stock
Par Value Shares - - - - \$1.00 (4s. 2d.)
For Plant and Development - 500,000 Shares.
Treasury Reserve - - - - 500,000 "

Head Office: Halifax, N. S., Canada.

Mine Office: Cheticamp, C. B.

Directors and Officers.

PRESIDENT—Mr. J. J. Stewart, President
People's Bank of Halifax, Acadia
Loan Corporation, Herald Publishing
Co., Director Trinidad Electric Com-
pany, Annapolis Valley Fruit Estates,
Limited, Commercial Trust Company,
Union Life Assurance Co., Halifax.

VICE-PRESIDENT—Mr. James Reeves, Treas-
urer Nova Scotia Furnishing Company,
Limited, Halifax.

SECRETARY-TREASURER—Mr. John W.
Regan, Journalist, Halifax.

Dr. M. A. Curry, President Hattie & Mylius,
Limited, Director People's Bank of
Halifax, Empire Trust Company, An-
napolis Valley Fruit Estates, Ltd., Union
Life Assurance Co., Halifax.

Mr. A. B. Crosby, Mayor of Halifax—of A.
B. Crosby & Co., President of The E. S.
Tracey Mfg. Co., Ltd., Halifax.

Mr. J. C. O'Mullin—Director Fundy Coal
Co., Ltd., Munro Wire Works, Ltd.,
President North American Seal Leather
& Oil Co. Ltd., Halifax.

Mr. Simon W. Crabbe—Director Charlotte-
town Light & Power Co. Ltd., Char-
lottetown Condensed Milk Co., Chair-
man Water and Sewerage Commission,
Charlottetown, P. E. Island.

Mr. Robert Moulton—Member Legislative
Assembly of Newfoundland, Shipowner,
Burgeo, Nfld.

Mr. Fred. P. Ronnan—President Industrial
Publishing Co. Ltd., Manager for Nova
Scotia of Ontario Accident Insurance
Co. and New York Plate Glass Insur-
ance Co., Halifax.

Mr. W. B. Dunn—President Inverness Min-
ing Co., Ltd., Halifax.

Mr. James Reardon—Director Inverness
Mining Co., Ltd., Halifax.

BANKERS—People's Bank of Halifax.

SOLICITORS—O'Mullin, Parsons & Gray, Halifax.

AUDITOR—Mr. W. H. Strachan, with Dominion Coal Co.

Introduction.—The Cheticamp Copper Company, Limited, is the
owner under lease from the Government of Nova Scotia of a valuable,
partly prospected and developed copper mining property at Cheticamp,
Cape Breton, described by Dr. Gilpin, head of the Mines Department of

Entered according to Act of the Parliament of Canada in the year 1905 by the
Cheticamp Copper Company, Limited, at the Department
of Agriculture, Ottawa.

Nova Scotia, as promising to rank among the largest copper mines in the world. The ore also carries gold and silver. The deposit is situated practically at tide-water. It is about 350 feet in thickness and dips east at an average of 45 degrees, strike N. 30 E., S 30 W. The ore has been exposed by open cuts and test pits for 900 feet along the line of strike, and at one point a slope has been put down on the dip of the deposit for 95 feet.

The continuation of the deposit has been traced for 1500 feet further. Over 100,000 tons of ore are reported practically in sight as a result of past development work. This is verified by the estimates of engineers who have examined the property. Extracts from their reports are printed herewith. One estimate makes the amount of ore practically in sight 400,000 tons, of which it is stated that 100,000 tons may be mined by open-cutting without going underground. It is the intention of the Company to further develop and operate the property, which includes certain timber and water power privileges useful for mining and milling.

Average Value of the Ore—Assays of ore from the open-cuts and test pits give an average of 3 per cent copper and \$1.00 to \$3.00 in gold and silver to the ton; those from the bottom of the slope show a highest content of 6.16 p. c. copper. Some samples from other points ran 7 p. c. and 10 p. c. copper with increased values in precious metals, but the property is considered as an immense low grade proposition. Assays of average lots of ore sent out from the property for concentration test ranged from 2 p. c. to 5 p. c. copper, beside gold and silver, or from 40 to 100 pounds of copper to the ton. It is estimated that the ore body will average from \$8.00 to \$12.00 per ton of total contents, which is equal to the yield of some of the world's greatest mines. In Cape Breton these figures should pay handsome profits with a large body of ore, owing to the economy of the situation, and low transportation charges to market.

Geographical Position—The company's property is the choice of locations in the heart of the Cheticamp Mining District, situated five miles in a south-easterly direction from Cheticamp village. Cheticamp lies nearly upon the 61st. meridian and in latitude about 46 deg. 30 min. north. The harbor is large and sheltered

Manager's residence and office

Store Miners boarding House

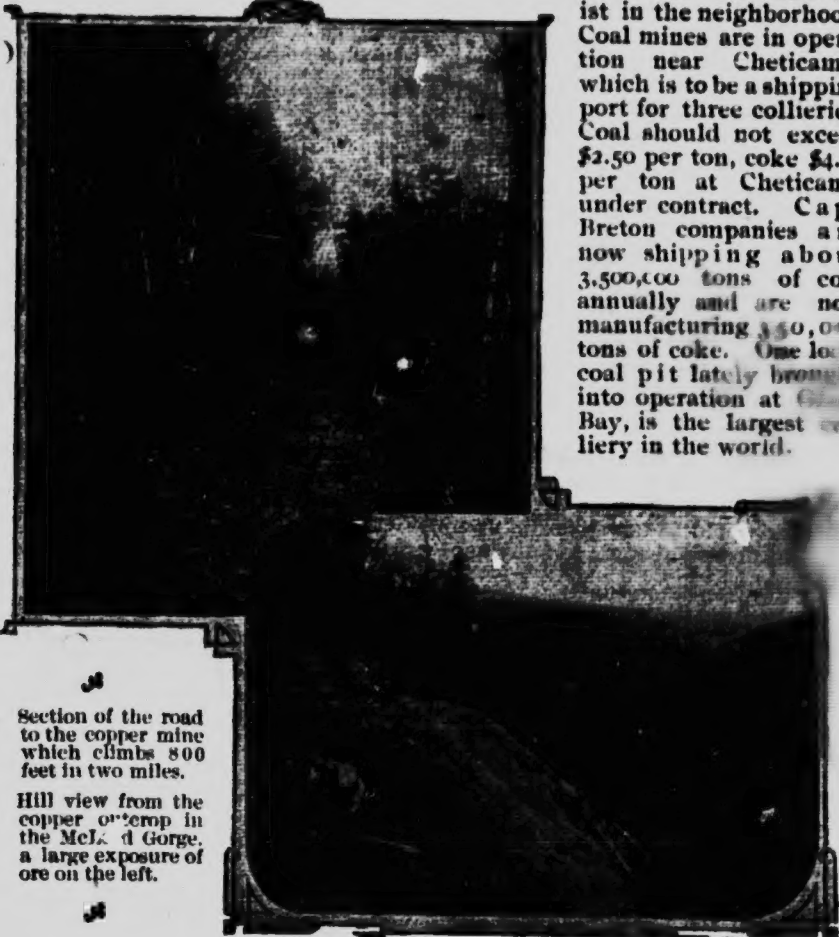
Stable Slope



being one of the best on the north-western shore of Cape Breton. Ocean ships can load here in safety for any part of the world. The Inverness Railway & Coal Company's railroad, which connects with the Intercolonial Railway at the Strait of Canso, has 80 miles of road in operation and is to be extended to Cheticamp for the shipment of coal from the Mabou, Inverness and Margaree coal (Chimney Corner) mines. The Cheticamp district will therefore have the advantage of rail and water communication with all points. The company's copper deposit is located on the great plateau of Northern Cape Breton and near the edge of its north-western escarpment at an elevation of about 1300 feet above sea level. The distance from the harbor by wagon road is about nine miles or nearly twice that of an air line. For $4\frac{1}{2}$ miles the road winds across the undulating plain of Cheticamp, then ascends the great gorge of the Cheticamp River for two miles, and for the remainder of the distance steadily rises through a wild and broken country consisting of a labyrinth of gorges, to the plateau. The road, however, is fairly good with the exception of a few stiff grades, most of which could be easily reduced.

Timber, Water-Power, Fuel, Flux, etc.—There is abundant growing timber, both hard and soft woods. A water power can be developed about a mile from the mine capable of furnishing 700 h. p. electrical energy at the mine. This can be supplemented from other sources. Ores of iron and

limestone for flux exist in the neighborhood. Coal mines are in operation near Cheticamp, which is to be a shipping port for three collieries. Coal should not exceed \$2.50 per ton, coke \$4.50 per ton at Cheticamp under contract. Cape Breton companies are now shipping about 3,500,000 tons of coal annually and are now manufacturing 350,000 tons of coke. One local coal pit lately brought into operation at Glace Bay, is the largest colliery in the world.

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1. Section of the road to the copper mine which climbs 800 feet in two miles.
 2. Hill view from the copper outcrop in the McLeod Gorge, a large exposure of ore on the left.

Improvements.—Manager's residence, assay office, miners' boarding house, store houses, stable, blacksmith shop, carpenter shop, magazine, etc., have been erected. Several miles of fairly good wagon road have been built. There is a quantity of mining tools etc., on the property.

Proposed Operations.—It is proposed to install a concentrating plant of moderate initial capacity to handle ore now in sight and ship the enriched product. Concentrates produced by the initial plant from \$10. ore can be shipped at a good profit. This would be a temporary procedure to continue until such time as the Company possessed full information necessary to undertake the erection of a smelter. At the same time that the initial preliminary plant will be treating ore now available, it is the intention of the Company to continue underground drifting and sinking, and also to further prospect the extent of the ore deposit by core drilling. The Mines department has offered the use of a Government drill for the latter purpose. Special attention will be devoted to making large working tests of the ore from different parts of the deposit.

Underground Development.—Professors Woodman and Sexton of Dalhousie University School of Mines, advise the following plan of underground work:—

"The present slope should be straightened, with a dip about 30 deg. and extended until it attains a length of 250 ft. A similar slope should be sunk to the south directly along the line of strike and say 1,000 feet distant. From the bottom levels should be run to meet, thus blocking out 200,000 square feet of section below fifty feet from the surface. We regard that depth as probably necessary for a working roof on account of the shattered state of the surface rocks and the sluggish water circulation on the flat plateau above. It might be worth while also to tunnel south from the south slope about 500 feet on the strike, thus blocking out 50,000 square feet additional. From the bottom of each slope, a cross-cut should be driven east and west. It probably would have to go but a few yards west to reach the foot wall, but must extend 300 feet or more to the hanging-wall if surface indications hold in depth. If this condition continues the operation will block out more than 5,000,000 tons of rock below fifty feet and between the two slopes. The tunnelling and cross-cutting south of the south slope would add a presumable 1,250,000 tons more. If the mineral continues evenly disseminated this will represent the amount of ore then in sight. The proportion which could be ultimately won would depend upon the system of work adopted. By the above development, however, the whole of that part of the ore body would be put into condition for remunerative working on a large scale. The amount of excavation required to effect this development (deducting the amount said to be opened by the present slope) would be about 9,400 tons, all in ore, hence not dead work. We believe, as already stated, that the present indications warrant such expenditure as will enable the above programme to be carried out."—The foregoing work represents about 2,000 feet of drifting and sinking the cost of which may be approximated at \$15.00 per foot; total \$30,000. The block of ground which would be opened up would only be a small section of the apparent extent of the whole ore deposit.

Working and Drainage Tunnel.—It is probable that ultimately it will prove economical and advantageous to work and unwater the Company's deposit by a long cross-cut tunnel similar to those driven in many parts of the world to tap deposits at considerable depth. Mr. M. V. Grandin reports on this feature in substance as follows:—

"There can be no doubt as to the wisdom of running such a tunnel, especially as the configuration of the country favors such a scheme in a remarkable manner. (Of course a great deal of work must be performed and information secured before a work of this magnitude be considered). Cross-cuts at intervals would, without doubt, reveal extensive and valuable deposits which do not outcrop. It would save 4 miles transportation over extremely rough country. It would afford the cheapest method of working and unwatering the mines it would tap. Great working, pumping and ventilation shafts with their enormously expensive machinery and cost of maintenance would not be necessary. A natural and inexpensive system of ventilation would be established in the place of an expensive and artificial one. Once the tunnel was completed the cost of maintenance would be practically nothing. The total length of the tunnel would be about 2½ miles and the cost with lateral branches about \$200,000. An up grade into the mountain of 8 inches in 100 feet would bring the tunnel about 1000 feet vertically below the copper deposit."

The tunnel would serve other properties enroute and it would be the main artery from which branches could be extended throughout the L'Abime division of the Cheticamp Mining District.



• Noon Hour at the Cheticamp Copper Company's Mine.

Geology—The Cheticamp Mining District lies partly within the Carboniferous and partly within the Pre-Cambrian formations. The former generally contributes the undulating and fertile country and consists of conglomerates, sandstones, limestones and gypsum, while the latter contributes the plateau and more rugged country and consists of felsites, syenites and other granitic rocks, together with chlorite, hydromica and hornblende schists. Both formations are frequently invaded by beds and dikes of trap. Three series of the carboniferous are here represented, viz., the Middle, Lower and Metamorphic. In the Pre-Cambrian the schists are the greatest ore contributors, although the granitic are frequently metalliferous. The rocks in which the Company's deposit occurs belong to the Pre-Cambrian system, which, as is generally known, consists in part of the oldest stratified rocks, and which is noted throughout the world for its wonderful ore bearing qualities—a great part of the useful and precious metals being derived from it. The principal mineral deposits of the district consist of beds or belts of ore bearing schist, some of which are of immense thickness. Phenomenal values have been shown at some of the deposits, but so far as known the district is essentially a low grade one, as are most of the important mining districts of the world.

The Company's copper deposit and the principal ore deposits within a radius of one and a half miles of it (arsenopyrite, galena and pyrrhotite) are contained in a belt of hydromica and chloritic schists from three-quarters to one and a half miles wide, confined principally to the drainage area of the L'Abime and Dauphine Brooks and bounded on the east and west by granite ranges. The uplifting of these ranges was accompanied by intense volcanic activity and sheets and dikes of molten rock were forced into the schists. The pressure produced by these convulsions threw the latter into a series of wave-like undulations, crushed, faulted and fissured them and thus developed those physical conditions which are essential to the birth of a mining district. The copper deposit consists of several beds aggregating not less than two hundred and fifty feet in thickness of hydromica and chloritic schists impregnated with copper pyrites. These schists have been thrown into an anticlinal fold and rest on what may be termed the McLeod Brook series which are of considerable but undetermined thickness. The rocks of the McLeod Brook series also carry sulphides disseminated through them but there is, as a rule, considerable difference in the nature of the sulphides carried by the two series. The nature of the rocks overlying the copper series has not yet been determined but the data so far collected indicates that they possess characteristics similar to the underlying formations.

* Official reports on the geology of the district by Dr. E. Sterry Hunt, Dr. J. E. Woodman (Harvard) Sir J. William Dawson, Mr. Hugh Fletcher, Professor H. Y. Hind and Mr. John Campbell and private reports by Mr. P. S. Hamilton, Mr. W. H. Kinnon and Mr. M. V. Grandin are available at the office of the Company.

Mining Improvements.—The copper deposit terminates at its north end in the McLeod River Gorge (Erin End) which cuts across the strike of the ore. Here the mineral appears as green carbonates. Eight hundred and sixty feet south is an open cut into the deposit from the west side of the hill, thirty-five feet in length, showing mineralization in both walls, though the rock is leached. An 1800 pound sample was taken from here by W. H. Kinnon, M. E. for a working test and a 100 pound sample was also sent from this point to Rossland, B. C. to be tested by the Elmore Oil Concentration process, which has been introduced at Rossland mines. The open cut is the approach to the entrance of an exploratory "slope," sunk on the "dip" of the deposit for 95 feet. The slope is timbered and provided with double track for hoisting in balance. The first 20 feet shows regular mineralization in floor and walls. The direction of the slope was changed at 20 feet and diverted to cut an overlying series and passed through partially leached and barren rock for a considerable distance, striking the ore again toward the foot where a sample furnished to F. H. Mason, F. C. S., Halifax, assayed 6.16 per cent copper. Immediately inside the entrance of the slope there is a short "drift" to the north showing coarse copper in all four walls.

There is a "sump" 20 feet deep in the floor of the slope showing coarse copper and regular mineralization.

Near the slope a trench or "ditch" extends fifty feet toward the hanging wall and shows evidence of continuous mineralization. Below the slope on the foot wall side of the deposit a number of ore outcrops are exposed in brook sections and by shallow pits.

Between the slope and McLeod Gorge there is a line of seven test pits, showing a shallow zone of oxides and carbonates of copper, with sulphides of copper immediately underneath. There is a birds-eye map of the mining property at the Company's office.

Assay Values.—Mr. M. V. Grandin gives the following assays, starting from the slope and going north to the McLeod Gorge :—

"An average sample of quartz veins near the surface at the slope and which had not the valuable contents leached out, the same as the surrounding schist, gave the following results :—

Gold \$6.60; silver \$4.40; copper 7.81 p. c.

"Along the ditch (trench) extending east towards the hanging wall the rock is very much leached and indicates that it formerly carried 3 p. c. or over of copper.

"Near the entrance to the slope an average sample across a thickness of 6 feet gave Gold \$1.32; Silver \$1.03; Copper 2.40 p. c.

"At a depth of two feet at the same point, average samples from the same thickness, which included quartz veins, gave in copper :—

No. One 3 p. c.; No. Two 4 p. c.; No. Three 5 p. c.; Gold and Silver not assayed for.

"An 1800 pound working sample, which did not include quartz veins, taken from this point by W. H. Kinnon, then the manager of the Pictou smelter, gave :—

Gold 0.09 oz.; Silver 3.90 oz.; Copper 3 p. c.

"From the data obtained at this opening it would appear that above the water line we may expect large masses of rock carrying about 3 p. c. copper, \$1.50 to \$2.00. In gold and \$1.50 to \$2.00 in silver, also that zones of ore of too low grade to work may be encountered. Below the water line we may expect a somewhat better class of ore, than at the top of the slope, carrying a little over 3 p. c. copper. I am not taking into consideration the gash quartz veins which would increase the average copper percentage and the gold and silver values.

"Test Opening No. 1—A few feet deep, rock very much leached. Quartz veins assayed from 2 to 3 per cent copper.

"Test Openings Nos. 2, 3 and 4—Very much leached when visited.

"Test Opening No. 5—The least oxidized samples gave 3 p. c. copper.

"Test Opening No. 6—Masses of quartz and partly decomposed lenses of massive chalcopyrite are met; samples here gave :

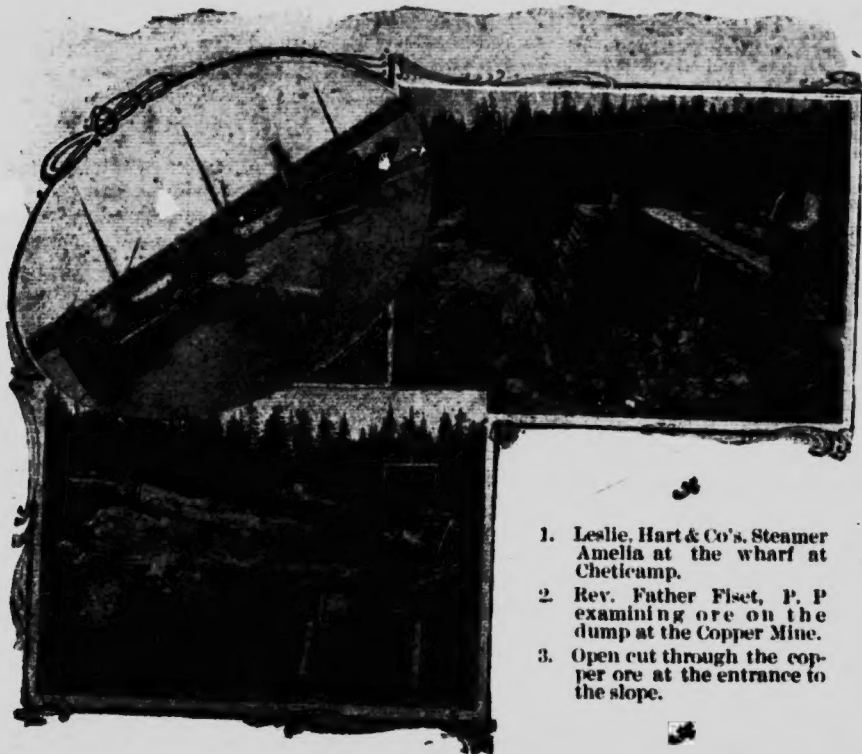
Gold 0.20 oz.; Silver 3.60 oz.; Copper 5.50 p. c.

"Test Opening No. 7—Similar conditions as at No. 6. Least oxidized material gave :—Copper 7.20 p. c.; Gold and silver not assayed for.

"At the Erin End, green carbonate incrusting rock runs as high as 3 p. c. and small masses of malachite mixed with limonite as high as 10 p. c. copper. Three to six feet in from the face of the cliff the least oxidized material gave;

Gold 0.15 oz.; Copper 5 p. c. Silver not assayed for.

"I believe Mr. Kinnon's opinion that the bulk of the ore will run about $3\frac{1}{2}$ p. c. below the zone of oxidation will be confirmed when the slope has been carried down to that depth and the deposit cross-cut. Above the water line the evidence is all in favor of the deposit running at least 3 p. c. copper, beneath say a 10 ft. crust of leached rock. The gold and silver values of the ore bearing rocks of this formation vary to a great extent but they rarely carry less than \$4.00 in gold and silver, generally exceed that amount, and occasionally carry as high as \$90.00 in gold. I think therefore that \$4.00 would be a conservative estimate of the gold and silver tenor of this deposit and that from a commercial standpoint the deposit may be regarded as a big low grade gold-copper proposition, averaging about \$10.00 per ton, figuring copper at 10 cents per pound."



1. Leslie, Hart & Co's. Steamer Amella at the wharf at Cheticamp.
2. Rev. Father Fliset, P. P examining ore on the dump at the Copper Mine.
3. Open cut through the copper ore at the entrance to the slope.

Concentration Tests—The concentrating character of the ore was tested by the Canadian Ore Concentration, Limited, (Elmore Oil process) Rossland B. C. Two lots were sent. The rock chosen for the purpose was weathered and part of its metallic contents leached out and the results are therefore better than if rich unaltered sulphides were taken from a depth, as oil acts best on unweathered rock. Seven tests were made with the first lot saving as high as 94.4 p. c. of the copper, 84 p. c. of the silver and 82 p. c. of the gold in different tests. In test "No. 172" a high saving of about 82 p. c. of the total values was effected. The ratio of ore to concentrates was 13 to 1. Mr. H. Hayman Claudet (Asso. Inst. M. M., Mem. Am. Inst., M. E.) technical representative of the Ore Concentration Co., who made the tests, states in his report that "your ore seems very suitable for our process" and in referring to Test No. 172. he says "I am confident that in practice we would better this".

The full report on the second lot of ore has not yet been received. In preliminary communications under recent dates Mr. Claudet says "one sample assaying 5.36 p. c. copper gave a high concentration. I did "not assay for gold and silver, but will do so later on. The result of the concentration test was very satisfactory."

He also writes:—"The working costs of an Elmore Plant, i.e., just the oil plant, exclusive of milling, will be 75 to 80 cents per ton, including loss of oil and royalty, with you I am sure you could figure on a considerable reduction. From what I understand the proper treatment would be to put up a small smelter and an Elmore plant, and you would be able to pick out your high grade ore and smelt direct, and your concentrates produced from the oil plant would also be smelted at your own smelter. From your excellent situation you would have every facility for shipping your matte either to New York or Swansea, and the great advantage of having your own smelter would be apparent, as any custom smelter will always make a lot on copper ores. (Concentrates from) similar ore we have tested would be sure to run from 15 p. c. to 20 p. c. copper. Mr. Anderson, who has been in charge of LeRoi mine here and of other properties in the vicinity, and whose stand-

ing as a mining engineer leaves nothing to be desired, considers that you have the largest thing in the country, and with such a scheme as recommended above, to use his own words, 'There is more money in it than all the mining undertakings in this Western country.' I understand that labor is comparatively cheap, you have all the necessary supplies handy, such as coke, oil, iron, lime, etc. If you take up this matter I would try to arrange a trip over there, when, I feel sure, I can work out arrangements and plans to give you a plant which would treat your ores at a good profit;

EXTRACTS FROM REPORTS ON THE MINE.

The mining property of the Cheticamp Copper Company has been reported upon by well known engineers. Copies of various reports and letters may be obtained from the Company. Extracts are given below:—

Dr. E. GILPIN, Jr., Deputy Commissioner of Public Works and Mines.—“You should continue your underground testing to ascertain the nature of the ore below the water drainage line, and to determine clearly the extent of the metalliferous ground, as well as the general richness of its metallic contents. Should this work show a continuation of the present conditions, you would have in a short time ground enough blocked out to warrant the investment of any amount of capital to install plant necessary for one of the largest copper mines in the world.”

Dr. Gilpin has been head of the Mines Department of Nova Scotia for twenty-five years and besides being a member of numerous scientific and geological societies in Canada and Great Britain, has lately been made a Companion of the Imperial Service Order for his contributions to science. He is personally familiar with the Cheticamp district and believes the copper ore will become richer with depth.

Dr. GILPIN for the Government of Nova Scotia.—“I have on several occasions drawn attention to the probability of the northern part of Cape Breton yielding valuable deposits of gold, silver, lead and copper. However as an outside opinion was worth more than one from an official of the Government, and would carry more weight with the world at large, Mr. Woodman's services were secured. You will be pleased to learn that he considers the district promising and that their mineral deposits have been very much undervalued, and that they should, if properly prospected and developed prove valuable additions to our mineral wealth.”

PROFESSOR WOODMAN for the Government of Nova Scotia.—“There is no doubt that the region occupied by the older rocks is one in which a number of districts are capable of successful development. I am more pleased to have arrived at this opinion because it has been reached by direct field work. Prosperity is far more likely to follow the healthy development of lasting investments which yield moderate rewards and I believe there is room for such in the ores of Cape Breton.”

Dr. J. E. WOODMAN, B. A.; S. B., (Harvard) and Prof. Frederic H. Sexton, B. Sc. (Mass. Inst. of Tech).—“Across the strike, a trench and natural sections show a breadth sufficient to give an actual thickness of 270 feet. Impregnation was not seen throughout this breadth but scattered well along it. It is certain, however, from direct and continuous evidence, that there is a thickness of 85 feet, entirely west of the slope head and on the foot wall side of the deposit. Upon a basis of a length of 860 feet, a surface breadth of 355 feet and a vertical depth of 115 feet; and allowing for topographical irregularities and a 50 foot working cover, it is estimated that you have actually blocked out 280,000 tons of rock, probably mineralized throughout. The method of occurrence of the ore seems to point to fine crushing as the best means of liberation. The stamp mill is the cheapest means for this purpose; but it gives an ill-sized product, and with your chloritic ores would produce much slimes. The ore will probably require close sizing. Crushing should not be carried so far as to need pulverizers, but would be best accomplished by fine rolls.”

“Concentration will follow crushing and sizing. In this, trial of special or patent treatment should follow that of ordinary methods; for the ore does not at present appear to offer any unusual difficulties. If jigging and table concentration fail, water classification may give better satisfaction. It would seem to us unnecessary to extract gold by cyanide bromo-cyanide or chlorination processes; because the gold will follow the copper in smelting, and can readily be extracted in the electrolytic refining of copper.”

W. H. KINNON, M. E. Denver.—“The Company's copper outcrop consists of chalcopyrite carrying both gold and silver. The ore is very finely and evenly disseminated through the rock. This deposit, has, where most of the work has been done, a small leached zone; a zone partly leached affording a mixture of carbonates, oxides, sulphides and sulphates. Probably below this zone occurs the zone of permanent sulphides. Assays from veinlets, have given some high values. An 1800 pound sample of average ore gave me 3 p. c. copper, 4 oz. silver and 0.16 ounces of gold; but the point from which the sample had been taken had been partially leached, so it is assumable on reaching the unaltered sulphides the copper values will be somewhat augmented.” Mr. Kinnon is a western mining engineer of large experience. He examined the mining property on behalf of Boston interests, who made a proposition of purchase to the then owners.

M. V. GRANDIN, M. E.—Mr. Grandin has been six years in the Cheticamp district in the capacity of geologist and mine manager. He has prepared for the company a comprehensive report on the mining property covering every feature of the undertaking, including water-power devel-

opement, location of mill site, general course of a proposed drainage and working tunnel to strike the deposit at a depth of 1,000 feet, treatment of ore, &c. The report makes a volume of 141 pages illustrated with 20 maps, plans and sections, and 89 photographs. In concluding his report Mr. Grandin says:—

"It is impossible from the facts before us to believe otherwise than that the deposit is one of immense size and value and one which, under proper management, is capable of being developed into one of the largest and most profitable copper mines in the world. I believe this estimate of the tonnage of pay ore in sight (100,000 tons) will prove to be a very conservative one."

R. H. ANDERSON, late Supt. of Le Roi No. 1 Mines, Rosland, B. C. and Oro Denoro Mines, Eholt, B.C.—"The very great thickness of the ore body and the excellent situation of the deposit on the mountain side are favorable for cheap mining. In British Columbia I have taken ore from an open-cut and put it on board box cars at a near siding for shipment to smelter, using hand barrows, for a total cost of 49 cents per ton. You ought to be able for some time to come to win a large body of ore at as favorable figures in Cape Breton. The low labor charges which prevail in Nova Scotia always arrest the attention of Western mine managers. An average of \$1.50 per day is in marked contrast with \$3.00 in British Columbia, Arizona, Montana, California and other localities. With conditions so favorable, and with proper management and a large body of ore, a recovery as low as two p. c. copper, that is about \$5.00, should cover all expenses of mining and treatment. Transportation by water to smelter at New York should be low, and it should often be possible to ship as ballast."

BENJ. T. SMITH, South Dartmouth, Mass.—"The largest single deposit of copper I have ever seen. The face of the mountain has been cleaned off to show about 50 feet of 5 p. c. copper ore carrying \$1.00 per ton in gold and silver each across the face of the vein. This can be mined cheaply, in fact quarried out, by open cutting." Mr. Smith made a tour of the copper mines of the Maritime Provinces and Newfoundland on behalf of American capitalists.

JOSEPH R. MONK, Mine Foreman.—"There appears to be ore enough in this deposit to last for many years production. The district is favorable for cheap mining, as the local labor is good and the rate of wages is from \$1.25 to \$1.50 per day for 10 hours. The rock blows and drills well and there is plenty of growing timber on the ground and good water power in the neighbourhood. The rate of wages is in strong contrast to the average rate in the West, namely, \$3.00 per day. I believe you have the making of a very large and steady paying mine and speak from 20 years' experience as a practical miner in Nova Scotia, Oregon and Idaho, having acted as underground foreman in several large mines in Nova Scotia and in the West."

H. L. BORDEN, Mine Superintendent, Cheticamp, C. B.—"Towards the hanging wall the deposit shows up well in sulphides and carbonates of copper. West of that the deposit shows a large amount of quartz formation carrying high values in gold. For a width of 45 feet of the deposit you have as good, if not better, copper proposition than there is on this continent, and in figuring on a large scale proposition the Company should not lose sight of the fact that in a full 160 feet width they have ore that, besides carrying good copper values, runs well up in gold and silver. I estimate the ore now in sight at 400,000 tons, and at least 100,000 tons of this can be quarried without going underground. In my judgment this is one of the biggest mineral properties in the world, with splendid facilities for mining and milling. My connection with practical mining both in this province and in the West extends over a period of 35 years."

Economic Location—Cape Breton is most favorably situated for profitable copper production. It is the only copper mining district where coal and ocean transportation are both adjacent to an extensive copper deposit. The Cheticamp section has the additional advantages of good local labor, low labor costs, large natural water powers and an abundance of timber and fluxes. In reporting upon a galena property located near the Copper Company's property Mr. W. H. Kinnon of Denver, gave the following figures:—

"With the cost of transportation, fuel, taxes, labor and supplies at a minimum the following figures could be in practice duplicated:

Cost of mining per ton	
Cost of concentrating	\$1.00
Cost of smelting per ton of run of mine ore	65
	70
	\$2.35

"Under the above general heads have been distributed various smaller items, including general expenses, etc. These figures are based on a daily tonnage of 500 tons."

Mr. Kinnon allowed 75 cents per ton loss in treatment, and he has offered his services to design and install a plant for the successful operation of the Company's mine. The above figures may be closely applied to the Cheticamp company's proposition.

Dr. E. D. Peters, Jr. of Boston, author of "Modern Copper Smelting"

"I approach the subject of smelting with some reluctance, as the extremely cheap coal and labor, and low ocean freights, owing to deep water right at the dock of a smelter would render this operation so much cheaper than usual that my estimates at first sight might seem preposterous; but I am calculating from the results of years of practical work and merely substitute the figures of Cape Breton costs for the ordinary costs:-

Mining, sorting, concentration and freight to deliver 180½ tons of ore and concentrates at smelter daily (resulting from mining 600 tons)	Cost per lb. copper produced
Putting the above into 99 per cent copper	2.48
	2.08
Total cost pig copper	4.91
Electrolytic separation and putting into electrolytic ingots or bars	53
Total cost of electrolytic copper	5.74 cents

This is probably a lower figure than obtains at any of the great mines.

Apparent profits on above basis (no credit is given for Gold and Silver in the copper. The marketing of the copper is not allowed for.)

Electrolytic copper @ 9 cents	-	-	-	-	-	Profit per lb.
" " @ 10 cents	-	-	-	-	-	3.26 - 100 cts
" " @ 12 cents	-	-	-	-	-	4.26 - 100 "
" " @ 14 cents	-	-	-	-	-	6.26 - 100 "
						8.26 - 100 "
	Mining	Surface	Mechanics		Mileage of	
	Labor	Labor	Labor	Coal	Rail Haul	
	per diem	per diem	per diem	per ton	to market	
Lake Superior	\$2.00	\$1.60	\$2.30	\$8.50	1000	
Arizona	3.00	2.50	4.00	7.00	3000	
Montana	3.50	3.00	4.75	4.00	2000	
British Columbia	3.00	2.50	3.50	6.00	5000	
Cheticamp	1.40	1.25	1.75	2.00	none	

Average number of pounds of copper per ton of ore at well known mines.
(From Stevens' Copper Hand Book).

	Lbs. Cop. per ton
Tennessee Copper Company	38
Granby Consolidated (B. C.) (Largest Copper producer in Canada)	50
Arizona Copper Company	75
Rio Tinto (Spain)	50
Sto. o Kopparberg (Sweden)	55
Tharsis Company (Spain)	40
Utah Consolidated	40 to 60
Anaconda (largest copper producer in the world)	60 " 100
Mansfelde (Germany)	50
Mount Lyell (Tasmania)	50
Tilt Cove (Newfoundland)	60 " 70
Canadian Copper Co. (Sudbury, Ont.)	55
Nichols Chemical Co. (Capelton, P. Q.)	60
Cheticamp Copper Co. (Cheticamp, C. B.) estimated	60 " 75

Estimated Profits.—Professors Woodman and Sexton state:

"It is our opinion that there should be a generous margin of profit if the ore runs \$10.00 per ton and does not carry arsenic in appreciable quantities. The net gain per ton will of course depend somewhat upon the amount of ore treated, as well as the efficiency of the work." Analysis of the ore has proved satisfactory as to deleterious substances.

Mr. R. H. Anderson, under whose superintendence of Le Roi No. 1, Rossland, B. C., mining and smelting costs were reduced to the lowest point in the history of that corporation and who, while in Nova Scotia recently, took occasion to investigate the Cheticamp company's proposition closely, writes as follows:

"\$10.00 ore at your property ought to net you, when mine and mill are in good working shape, \$2.50 to \$3.00 per ton at a conservative estimate." This would be a profit of about \$500,000 on the estimated amount of ore now in sight at the mine.

That Mr. Anderson's figures are within the mark is confirmed by the

careful calculation of Mr. W. H. Kinnon in reference to the cost of mining and treating galena at Cheticamp, on ore of a low primary value of \$5.85 per ton, there is shown a net profit of \$2.75 per ton after allowing for mining, milling, smelting and administration, expense and loss in concentration. In the Boundary district of British Columbia the copper ore treated at the Granby mine averages about \$5.00 total contents; that of the Tennessee Copper Co., at Polk Co., Tennessee averages about \$4.50. These mines are notable examples of profitable low grade propositions. The Tennessee company owes its success to skilful management, cheap coke and southern labour; the Granby Co's success is also attributed to able management, to the large tonnage handled (2,000 tons per day) and to the composition of the ore being favorable for economic smelting. The Granby Company mines a large proportion of ore by the system of open-cutting, notwithstanding the inclemency of a winter climate. This company probably holds the record for low mining and smelting costs when the high fuel and labor charges of British Columbia are taken into consideration.

A profit of \$5.00 per ton on the Cheticamp Company's \$10.00 copper ore might with justice be anticipated under proper management and if the ore was smelted on the ground; but instead, the moderate figure of \$2.75 is adopted as a basis of calculation. With a plant having a capacity of 100 tons per day this would mean a profit of \$82,500 for a year of 300 days; with 500 tons daily capacity the yearly profits of the Company would be increased to \$412,500 and as apparently any tonnage of ore desired could be won from the mine, the plant would probably be doubled or quadrupled in due course to take care of an output of 1,000 or even 2,000 tons per day, giving an estimated yearly profit of \$1,650,000, on the latter output of 2000 tons of

ore. These figures suggest the great possibilities of this enterprise and explain the faith in its future entertained by engineers and others familiar with its prospects. The profit on coal mined in Nova Scotia scarcely averages \$1.00 per ton and as the development of the Cheticamp Company's proposition into an undertaking of the first magnitude will involve moderate capital in comparison with the large capitalization employed by the big coal companies it will be perceived why copper production has become one of the greatest industries of the day and how the world's great copper mines pay shareholders ten, twenty, or thirty per cent annually on money invested. The



Cascade on the L'Abime River, Cheticamp.

question of markets does not concern a copper producer, in view of the rapidly increasing consumption of the metal, and at the present price of refined copper, exceeding 15 cents, the above estimated profits would be much greater, as they are based on a ten cent figure—the low level of prices. All authorities agree that the tendency of the price of the metal is steadily upward, and a seventeen cent market for copper is confidently predicted.

Capital Required—During the next twelve months it is considered that

- 1st—Underground development work should be continued.
- 2nd—The extension of the deposit to the south should be prospected with a diamond drill to prove the extent of ore reserves.
- 3rd—A concentrating plant of moderate initial capacity, say 25 tons per day, should be installed.

In the meantime the company is advised to mature plans for—water power development—increasing the capacity of the concentrating plant—erecting a smelter—and investigating the advisability of a drainage and working tunnel—in readiness for these works to be taken up in the following year and year after. \$75,000 to \$100,000 (£20,586) will be required during the current year. It is proposed to increase the operations of the Company gradually, and further capital to extend the output and development of the mine will be obtained according as new features of the enterprise require to be taken up.

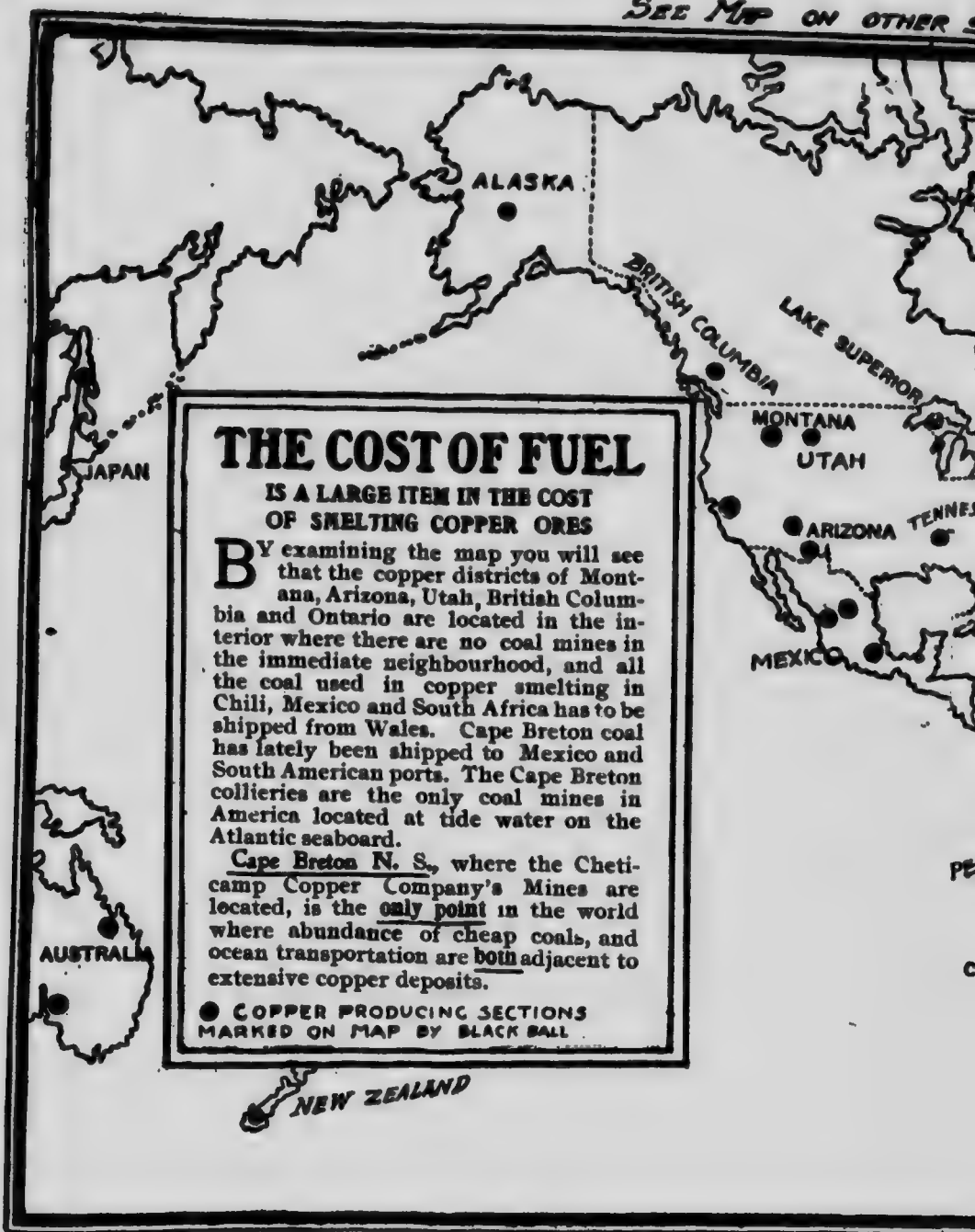
Custom Smelting—A subject which the Company has in view is the opportunity for conducting custom smelting and refining works at some central point in Nova Scotia for the accommodation of the copper and lead mines of the Maritime provinces and Newfoundland. Ores and materials for the plant could be assembled by water. There is at present nothing of the kind in Eastern Canada and a number of promising mining properties are being developed at various points, usually located at tide water. Newfoundland mines already ship 20,000 tons of copper ore per year, principally to Swansea. The possession of the large Cheticamp deposit insures the requisite of ore supply and may give this Company the key to carrying out the project of a public refinery and smelter, while a mixture of ores would economise the cost of treating the company's own ore.

Virgin Territory—The northern part of Cape Breton embracing about one thousand square miles is virgin territory so far as mineral development is concerned. Cheticamp is the gateway to this section. There are a number of fishing settlements around the coast, but prior to the prospecting work performed by the promoters of this Company no systematic effort is known to have been made to locate the source of the gold found for years in the bottom of some of the streams. It is believed now that this alluvial gold came from the extensive copper schists on the Company's property, the precious metals being released by gradual disintegration of the ore by weathering. The immense size of the Cheticamp Company's mineral deposit has attracted wide attention and references to same have appeared in the N.Y. Eng. & Min. Journal (Feb 18 1904), Toronto Globe, Canadian Gazette (London) London Mining Journal, Canadian Mining Review, New York Herald and many other leading papers. The articles of the Eng. & Min. Journal and the Globe were illustrated, two boats from Pictou and Mulgrave make twice-a-week connection with Cheticamp. There is a daily coach between Cheticamp and Inverness. Subsidies have been authorized for continuing the Inverness railway to Cheticamp, the work to be commenced in 1905.

The Copper Industry—75 per cent of the world's production is derived from low grade sulphide ores, varying from 2 to 4 per cent. copper, in some cases carrying by-products. Big deposits of fairly uniformly mineralized material permit of a large output of ore and consequent cheapening of cost of production. With a visible supply of ore for many years, they offer the permanency necessary to justify the employment of capital sufficient for large scale operations. Given material for years of operation, with the average value per ton and the cost of the finished product determined and the project becomes a manufacturing rather than a mining undertaking, the amount of profit per year being made a matter of executive control, subject to be increased according as the plant employed in the undertaking is extended and the output enlarged. The world's production and consumption of copper has increased from 50,000 long tons in 1860 to 532,700 long tons in 1902. The normal yearly increase, six per cent, will call for 79,000,000 pounds of new copper next year and more still each succeeding year. This is equivalent to a Calumet & Hecla, a Boston & Montana, or a Rio Tinto and statisticians of the trade wonder where the increase is to come from to meet the increase in demand. Well situated copper deposits are as valuable as good deposits of iron ore. The red metal has taken a high position in the arts and manufactures and copper production is now among the great staple industries. Mining journals point out that the copper companies of the United States distributed more money in dividends in 1904 than the railways of the country and the general tendency of the price of copper is upward, in consequence of the increasing ratio of demand and decreasing ratio of production.

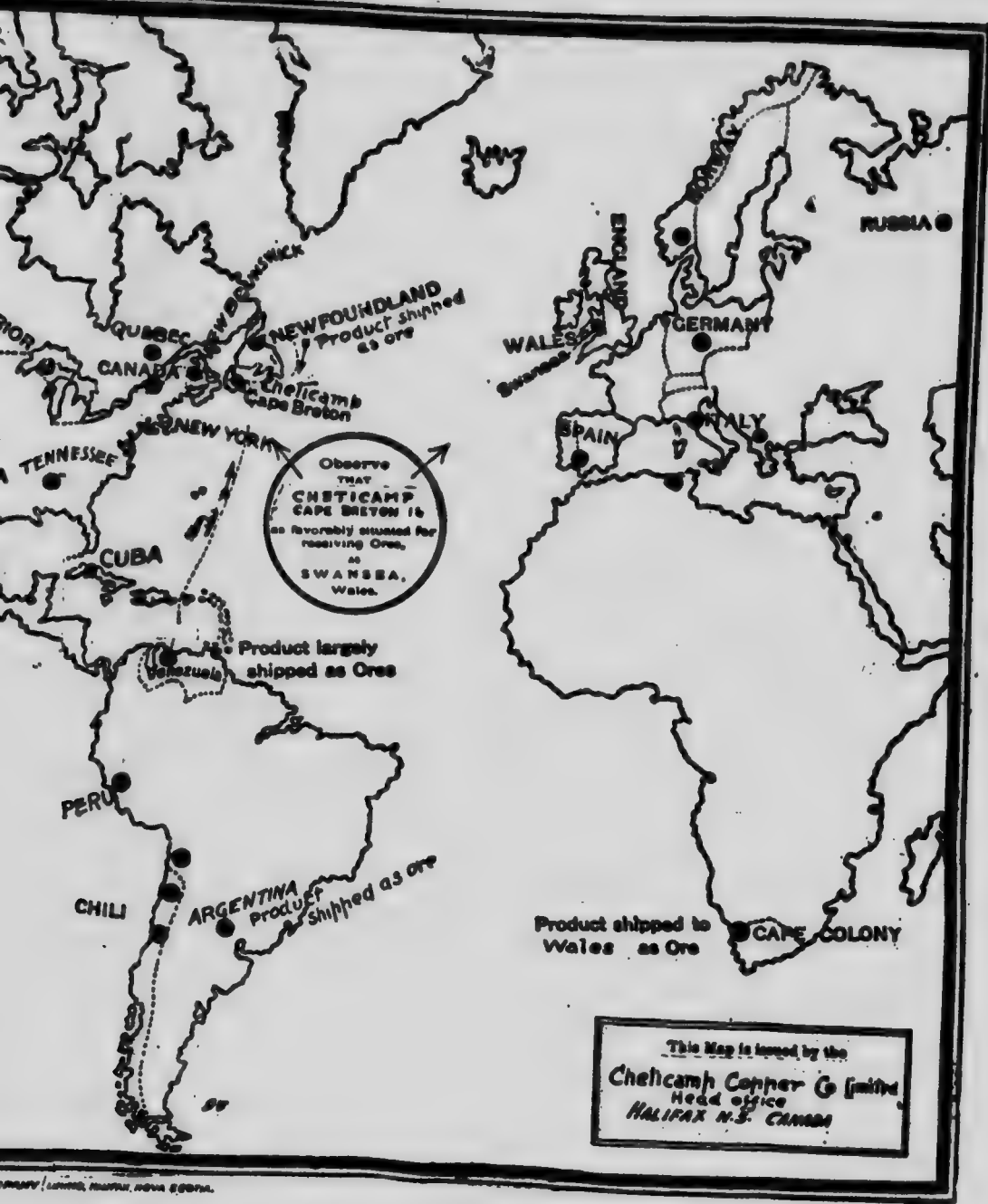


SEE MAP ON OTHER SIDE



GRANTED ACCORDING TO ACT OF PARLIAMENT AS THE DEPARTMENT OF AGRICULTURE OBTAINS IN THE YEAR 1886, BY THE CHETICAMP COPPER COMPANY LIMITED.

OTHER SIDE OF THIS SHEET ALSO.



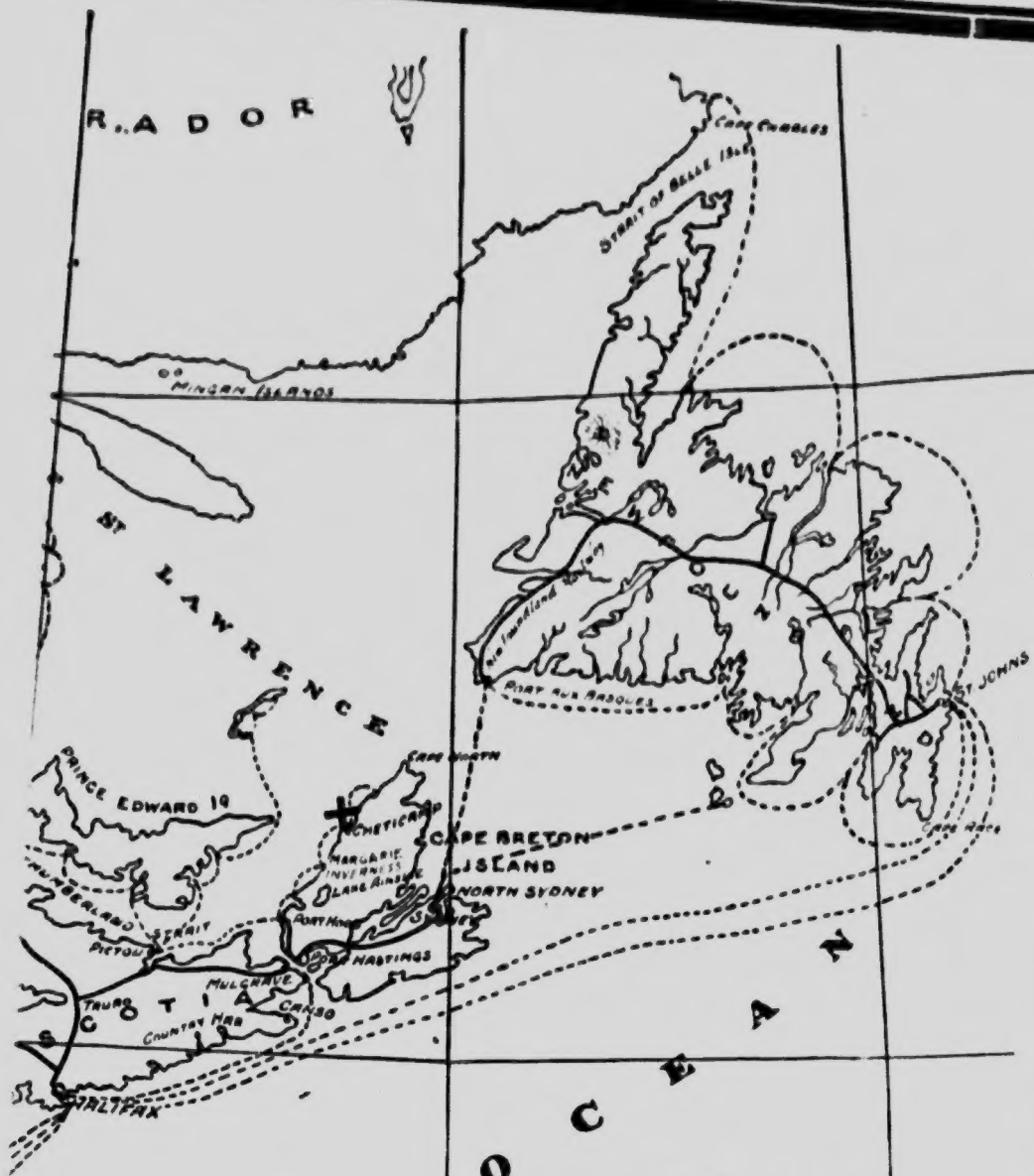




X LOCATION OF CHETICAMP COPPER CO'S MINES

TABLE OF DISTANCES BY WATER.

	MILES		MILES
Cheticamp to New York (approximate)	840	Cheticamp to Liverpool (approximate)	2250
Cheticamp to Boston	630	Cheticamp to Cape Town	6470
Cheticamp to Montreal	620	Cheticamp to Pernambuco	3620
Cheticamp to Quebec	480	Cheticamp to St. Johns, N. F.	275
Cheticamp to Halifax	250	Cheticamp to Port Aux Basque,	
Cheticamp to St. John, N. B.	530	Newfoundland	80



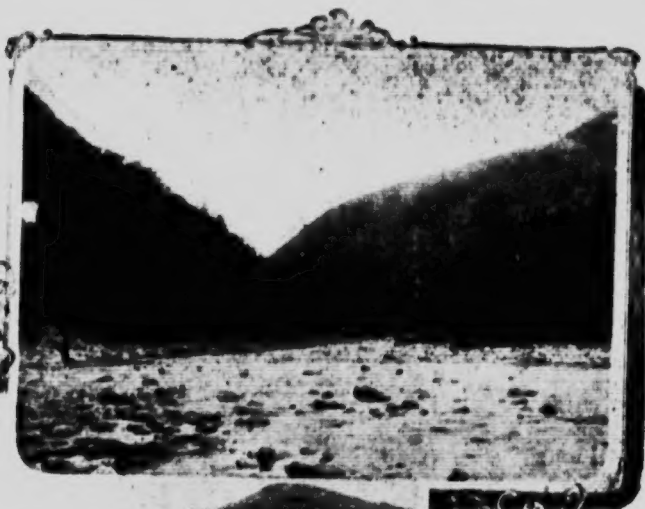
...MAP...

OF Eastern Canada and Newfoundland.

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amp to Quebec - - -	480	Cheticamp to St. John's, N. F. - - -	275
amp to Halifax - - -	250	Cheticamp to Port Aux Basque, Newfoundland - - -	80
amp to St. John, N. B. - - -	530		



1.
Scene at the
mouth of the
Cheticamp
River.



2.
Looking up
the Cheti-
camp River
from its point
of junction
with the
L'Abnue.

THE mining property of the Cheticamp Copper Company, Limited, at Cheticamp, C. B., including certain timber and water power privileges, buildings, mining tools, etc., was acquired by the Company under contract dated June 29th, 1904, which is on file at the office of the Registrar of Joint Stock Companies at Halifax, Nova Scotia.

The property is fully paid for and is free from mortgage or encumbrance of any kind. No bonds, debentures or preferred stock have been issued by the Company in connection with the above transaction or for any other purpose.

